



Prevalence and Risk Factors Associated With Postpartum Depressive Symptoms Among Women in Vientiane Capital, Lao PDR

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Postpartum depression (PPD), the onset of depressive episodes after childbirth, is the most common psychological condition following childbirth, and a global public health concern. If undiagnosed and/or untreated, postpartum depression can have negative effects on maternal and child health, however, there are few studies on the prevalence of postpartum depression in low- and middle-income countries. To contribute to filling this gap, this study examined the prevalence and risk factors associated with postpartum depressive symptoms among women after delivery in Vientiane Capital, Lao PDR. The study was a cross-sectional design, with multistage sampling used to identify women between 4 and 24 weeks after giving birth ($N = 521$). The Edinburgh Postnatal Depression Scale was used to identify women with postpartum depressive symptoms. Univariate and multivariate logistic regressions identified risk factors associated with postpartum depressive symptoms. The prevalence of postpartum depressive symptoms among participants was 21.3%. Associated factors were having at least 2–3 living children (AOR: 1.9, 95% CI: 1.1–3.0), experiencing mental health problems during pregnancy (AOR: 3.3, 95% CI: 1.4–7.6), experiencing conflicts with family members (AOR: 2.5, 95% CI: 1.5–4.0), the experience of intimate partner violence (AOR: 2.6, 95% CI: 1.3–5.5), and receiving moderate social support (AOR: 5.6, 95% CI: 3.2–10.0). In contexts where access to mental health specialists has severely constrained maternal and child healthcare providers at primary health care must be supported to develop the necessary skills to identify risk factors and symptoms and offer basic essential services for postpartum depressive symptom (PDS). The study identified a high proportion of mothers with postnatal depressive symptoms, highlighting the need to screen and treat mothers who present with PDS, as not doing so exposes mother and their children to a range of negative health and social outcomes. Addressing the stigma associated with mental health illness and mental health illness and domestic violence that prevents women from seeking healthcare, must also be developed, implemented, and evaluated.

Keywords: prevalence, risk factors, postpartum depressive symptoms, Edinburgh Postnatal Depression Scale (EDPS), low-income country, Lao PDR

INTRODUCTION

Postpartum depression (PPD), the onset of depressive episodes after childbirth, is the most common psychological condition following childbirth, and a global public health concern (1, 2). A recent review of 565 studies from 80 different countries or regions, estimated the global prevalence of PPD to be 17.22% (95% CI 16.00–18.51) (1). This estimate is higher than the often-cited prevalence rate of 13% (95% CI: 12.3–13.4%), derived from a meta-analysis of studies from higher-income countries (3), and lower than the 19% prevalence rate for PPD obtained from studies of low- and middle-income countries (4). The review also found significant differences between geographic regions and confirmed low- and lower-middle-income countries carry the greatest PPD burden (1). Within Asia, the study found that Southern Asia had the highest prevalence (22.32, 95% CI 18.48–26.70), followed by Western Asia (19.83, 95% CI 17.33–22.58), Eastern Asia (17.39, 95% CI 16.09–18.77), and South-East Asia (13.53, 95% CI 11.00–16.52) (1).

Postpartum depressive symptoms (PDS) may occur at any time up to a year after childbirth, often peaking 4–6 weeks postpartum and disappearing spontaneously 2–6 months after giving birth but can last longer (5). Symptoms can include sadness, nausea, anxiety, irritability, decreased libido, feelings of isolation, and disturbances in appetite, energy, and sleep (1, 6). Thoughts of hurting oneself and/or the infant, are also common symptoms of PPD, which can have negative impacts on family relationships (7–9). Negative long-term consequences to the infant can include delayed cognitive, social, emotional, and physical development with potentially long-term effects (10–14). PDS, however, are often overlooked, resulting in late diagnosis and increased chances of aggravating PPD.

A variety of factors, including demographic (4, 15, 16), obstetric (17), and environmental factors (18) and it is a complex interplay of these factors that create vulnerability to PPD. Socio-demographic factors associated with PPD include younger age of mothers (4, 15), low education (17), unemployment (19), low income (17, 20, 21), and previous experiences of mental health disorders (20, 22, 23). Obstetric risk factors include complications during labor, or immediately postpartum, such as obstetric hemorrhage (24), unplanned pregnancies (24), and having two or more children (25). The evidence related to a number of children and PPD, however, is mixed, and it is unlikely to be an independent factor for developing PPD. Regarding the social environment, poor social support including emotional support and empathetic relations with family and community members (26) and experience of violence (27) is associated with an increased risk of PPD.

Cultural and family factors may be risk or protective factors for PDD. Family support including from mothers and mothers-in-law where the support provided meets the needs and expectations of the mother can be protective (28). Family and social support can however be a source of conflict, especially where there are differences in thinking and parenting concepts between older and mothers of more influential family members (28). In some countries, women are expected to go through a period of confinement postpartum, usually for a period of about

4 weeks during which there are often behavioral and dietary restrictions (29). In Southeast Asia, after giving birth mothers may rest for up to 1 month on a “hot bed” –a bed with a fire lit beneath it, which is thought to strengthen the health and accelerate the contraction of the uterus of a woman. During this time care is often provided by female relatives including mothers or mothers-in-law, often including the preparation of special foods and herbal tonics (29). This increased support temporarily changes the mother’s role from caregiver to one who is cared for (30). The extent to which cultural practices in different countries are associated with PDD, however, is not well understood, with evidence on the role of confinement practices complicated by the heterogeneity of these practices (1, 30, 31). These cultural practices are also dynamic and influenced by factors such as changing economic systems, industrialization, globalization, and immigration (30).

Despite concern about PPD, an understanding of its prevalence in the Lao PDR, a lower-middle-income in South-East Asia, with few mental health services, is scant. A 2018 report on psychiatric services revealed there were 2,421 patients with a mental health condition, of which around 10% (240 cases) were diagnosed with depression, of whom 64% were women. The number of women with PPD specifically however was not reported (32). The reported number of cases is also likely to be significantly lower than the true number of people experiencing mental health disorders due to low awareness of mental health disorders, low health-seeking behaviors, stigma related to mental health disorders, and few mental health specialists or services in the country (32). There are, for example, only two hospitals in Lao PDR, both in the capital city of Vientiane, that have psychiatry departments, but neither of these departments has psychiatric specialists (32). The only available information on PDD comes from an unpublished study in 2017 conducted among women 6 weeks after giving birth in Odoumxy Province which indicated a prevalence of 15.2% PPD (21). To build on this work, this study was conducted to determine the prevalence and risk factors associated with PPD among women in Vientiane Capital, Lao PDR.

MATERIALS

This study was an analytical, cross-sectional, quantitative design, conducted among 48 communities in urban and peri-urban areas within Vientiane Capital. The Capital consists of nine districts, only three of which are entirely urban. A total of 77.9% of the population live in these urban districts, among whom are 22 births and 4.9 deaths per 1,000 population (33).

Study Participants

The inclusion criteria for participants were mothers between 4- and 24-weeks postpartum and living in the selected communities at the time of the study. The sample size was calculated based on a single population formula, corresponding to a 95% confidence level at $Z = 1.96$, and an estimated prevalence of PDS from previous research of 15% ($p = 0.15$) (21). The absolute precision was $d = 0.04$, with 1.7 allowed for the design effect and 5% for the non-response rate, producing a sample size of 540 mothers.

Multistage sampling was used to identify potential participants and maximize opportunities to recruit women from different socio-demographic backgrounds. One urban (Sisattanak) and one peri-urban district (Hadsayfong) within Vientiane Capital were selected using simple random sampling. Simple random sampling was then applied to select villages in each district, with 18 villages selected from the Sisattanak district and 30 from the Hadsayfong district. A total of 260 mothers from the Sisattanak district and 261 mothers from the Hadsayfong district were enrolled in the survey, with all interviews being completed within 1 month.

Measurement of Variables

The independent variables consisted of socio-demographic characteristics, obstetric, pregnancy and pediatric health factors, and family relationship factors. Socio-demographic variables included maternal age, level of education, occupation, ethnicity, religion, marital status, and self-reported household financial status. The obstetric, pregnancy, and pediatric health variables included number of pregnancies, number of deliveries, number of abortions, number of living children, history of stillbirths, pregnancy planning, number of antenatal care visits, complications during pregnancy, complications during the postpartum period, mental health problems during pregnancy, mode of delivery, gestational age of birth, infant feeding, and newborn health status. Family relationship factors included living arrangements, conflicts with family members, social support, and intimate partner violence (IPV).

Perceived social support was measured by the Multidimensional Scale of Perceived Social Support (34). The scale consists of 12 questions, each with a 7-point Likert scale and questions related to family, friends, and significant other support. The overall average score for social support was determined as follows: <3 is low, 3–5 is moderate and > 5 is high social support (34). The Women Abuse Screening Tool (WAST) was used to assess IPV. The WAST includes 8 items, each scoring 1 for never or none, 2 for sometimes, and 3 for a lot or often. Total scores range from 08 to 24, with the recommended cut-off of 13 applied to indicate the presence of abuse (35).

The dependent variable was the occurrence of PPD derived using the Edinburgh Postpartum Depression Scale (EPDS). The EPDS is the most common measure used to screen for depression related to childbearing (1), it is not, however, a clinical diagnostic tool and should be complemented with clinical assessment. The EPDS consists of ten questions each with four choices, scoring 0, 1, 2, and 3 for questions 1, 2, and 4, and reverse scoring 3, 2, 1, and 0 for questions 3, 5–10. The total scores range from 0 to 30, with respondents scoring ≥ 10 considered as having depressive symptoms (36).

Statistical Analysis

This study used EpiData to enter the data and Stata 14 for analysis. Descriptive statistics were applied to analyze the frequency and percentage of the independent and outcome variables. Tests for significance were undertaken using univariate analysis, and the results of these with a $p < 0.2$ were included in the multivariate logistic regression. A backward stepwise

selection was applied with the level of significance for variables to remain in the final model set at $p < 0.05$, a 95% confidence interval for estimating the precision of the odds ratio, and the respective variables with significant associations.

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the University of Health Sciences in Lao PDR (No 190/19), and the Ethical Review Board for Biomedical Research, Hanoi University of Public Health (No: 431/2019/YTCC-HD3). The research objectives, methodology, and potential risks were made known to each respondent and written consent was obtained before the interview. Participants were free to withdraw from the study at any time. To respect the confidentiality of participants, the names of respondents were not included in any results, and the data was securely maintained.

RESULTS

Socio-Demographic Profile of Participants

A total of 521 postpartum mothers completed the survey (50.1% from the peri-urban district and 49.9% from the urban district. Just over half of the participants (53.7%) were aged 21 to 30 years, with a mean age of 27.5 (SD = 5.8). Most participants (97.7%) were married, and over half (58.8%) were unemployed at the time of the study (Table 1).

Obstetric, Pregnancy, and Pediatric Health Factors

Around half of the participants (51.4%) had two-three living children. The minimum number of children was one and a maximum of six. A total of 56.3% of the participating mothers were between 13 and 24 weeks after childbirth when interviewed. Over half (54.1%) had planned their last pregnancy, 6% reported mental health problems during their last pregnancy, and most (80.4%) reported a normal vaginal delivery. Almost all (94%) had healthy babies, 9% had a preterm birth (≤ 36 weeks), and 55% exclusively breastfed their babies.

Mothers' Relationships With Family Members

Nearly 40% of mothers reported sometimes having conflicts with family members. Over half (56.1%), reported receiving moderate social support, and just under 9% had experienced IPV (Table 2).

Prevalence of Postpartum Depressive Symptoms

Among the 521 mothers, 111 (21.3%) met the criteria of PDS as measured by an EPDS score of ≥ 10 (Table 3).

Risk Factors Associated With Postpartum Depressive Symptoms

The 18 independent variables that had a $p < 0.2$ in the univariate analysis—level of education, ethnicity, religion, financial status, planning of last pregnancy, number of antenatal care visits in recent pregnancy, complications during last pregnancy, mental health problems during last pregnancy, mode of delivery, number

TABLE 1 | Socio-demographic-economic profiles of the participants.

Characteristics (n: 521)	Frequency	Percentage
District		
Sisattanak (urban)	260	49.9
Hadsayfong (peri-urban)	261	50.1
Maternal age (Mean 27.5 years, SD 5.8 years, Min: 16, Max: 42)		
16–20	78	15
> 20–30	280	53.7
> 30–35	116	22.3
36–42	47	9
Level of education		
Never been in school/Primary school	128	24.6
Lower/ Upper secondary school	217	41.7
Vocational/Higher vocational certificate/Bachelor's degree or higher	176	33.7
Occupation		
Employed	215	41.2
Unemployed	306	58.8
Ethnicity		
Lao-Tai	443	85.2
Other ethnicity	78	14.8
Religion		
Buddhism	440	84.4
Other religion	81	15.6
Marital status		
Married	509	97.7
Other (single/divorced/separated/widow)	12	2.3
Financial status		
Enough with savings	198	38
Enough without savings	215	41.3
Not enough	108	20.7

TABLE 2 | Family relationship characteristics of participants.

Family relationship factors	Frequency	Percentage
Living arrangement		
Living apart from family of birth/in-laws	219	42.0
Living with family of birth	202	38.8
Living with family-in-law	100	19.2
Conflicts with family members		
Never	295	56.6
Sometimes	208	39.9
Often	18	3.5
Social support (Min: 3, Max: 6.83)		
High support (6–max)	229	43.9
Moderate support (3–5)	292	56.1
Low support (min–2.9)	0	0
Intimate partner violence WAST score (Min: 12, Max: 24)		
Non-present IPV < 13	477	91.5
Present IPV ≥ 13	44	8.5

of pregnancies, number of deliveries, number of abortions, number of living children, gestational age of birth, conflict with

TABLE 3 | Prevalence of postpartum depressive symptoms.

	EPDS score < 10		EPDS scores ≥ 10	
	Frequency	Percentage	Frequency	Percentage
Postpartum depressive symptoms in two districts	410	78.7	111	21.3
Sisattanak district	202	77.7	58	22.3
Hadsayfong district	208	79.7	53	20.3

family members, living arrangement, intimate partner violence, and social support—were entered into the multivariate analysis. The variables significantly associated with depressive symptoms in the multivariate logistic regression were mothers who had 2–3 living children (AOR: 1.9, 95% CI: 1.1–3.0), mothers who had mental health problems during pregnancy (AOR: 3.3, 95% CI: 1.4–7.6), mothers who experienced family conflicts (AOR: 2.5, 95% CI: 1.5–4.0), women who received moderate social support (AOR: 5.6, 95% CI: 3.2–10.0), and women who had experienced IPV (AOR: 2.6, 95% CI: 1.3–5.5) (Table 4).

DISCUSSION

This study investigated the prevalence of PDS and associated risk factors among women in Vientiane Capital, Lao PDR. The study revealed that around one-fifth of participants had depressive symptoms during the postpartum period as measured by the EPDS. This figure is higher than that found in Odoumxy in the north of Lao PDR (15.2%) (21) and findings from neighboring Thailand where the prevalence of PPD was reported to be 8.4% (37). These differences may be due to differences in study designs (e.g., sample size, parity, socio-economic class), and in outcome measurement (e.g., screening questionnaires used and the timing). The study in northern Lao PDR, for example was conducted among women from 1 to 6 weeks after delivery, whereas the sample in this study was postpartum mothers between 4 and 24 weeks. The study in Thailand used an EPDS score of ≥ 13 as an indicator of having depressive symptoms, whereas in the present study we applied a score ≥ 10 (36). The prevalence of PPS in the present study is however comparable to a study in rural Bangladesh (22%) (38), studies in South Asia (39–41), although higher than those reported for South-East Asia reported in Wang et al. (1) global review (13.53, 95% CI 11.00–16.52) and in higher-income countries. Consistent with studies in higher-income countries and within Asia, postnatal depression was associated with antenatal experiences of poor mental health, family and marital disharmony, exposure to IPV, and not enough social support from partners, families, and friends (39–43). Having 2–3 living children was also associated with PDS which may be due to women with more children having many activities and financial concerns. This finding is contradicted in other research, however, including China (44) and Vietnam (45), and number of children may not be an independent factor for developing PDS and warrants further research.

TABLE 4 | Risk factors associated with PDS among participants.

Variables	EPDS < 10 F (%)	EPDS ≥ 10 F (%)	COR (95% CI)	p-value	AOR (95% CI)	P-value
Number of living children						
1 child	203 (83.5)	40 (16.5)	1		1	
2–3 children	200 (74.6)	68 (25.4)	1.7 (1.1–2.6)	0.014	1.9 (1.1–3.0)	0.009*
4–6 children	7 (70)	3 (30)	2.2 (0.5–8.7)	0.2	2.6 (0.5–12.1)	0.2
Mental health problems during pregnancy						
No	395 (80.9)	95 (19.4)	1		1	
Yes	15 (48.4)	16 (51.6)	4.4 (2.2–9.2)	0.000	3.3 (1.4–7.6)	0.005*
Conflicts with family members						
Never	152 (85.2)	43 (28.8)	1		1	
Sometimes/Often	158 (69.9)	68 (30.1)	2.5 (1.6–3.8)	0.000	2.5 (1.5–4.0)	0.000*
Social support						
High social support	212 (92.6)	17 (7.4)	1		1	
Moderate social support	198 (67.8)	94 (32.2)	5.9 (3.4–10.2)	0.000	5.6 (3.2–10)	0.000*
IPV						
Non-present IPV	389 (81.5)	88 (18.5)			1	
Present IPV	21 (47.7)	23 (52.3)	4.8 (2.5–9.1)	0.000	2.6 (1.3–5.5)	0.007*

The symbol * indicates statistically significant values at $p < 0.005$.

This study indicates mothers who experience mental health problems during pregnancy are more likely to experience PDS. Similar findings have been reported in studies in Vietnam (46), Thailand (47), and South Korea (48). This finding may be due to hormonal imbalance during pregnancy and the postpartum period contributing to a relapse of depression (27). While results are mixed, an increasing body of research suggests PPD with onset proximal to childbirth, is a discrete depressive disorder, highlighting the importance of integrating screening, and mental health support into routine maternal care (49, 50). Integrating mental health into perinatal care requires providers are empowered with the skills necessary for them to offer basic but essential services for PDS, especially in lower- and middle-income countries where there is often very limited access to mental health specialists. Research indicates non-physician primary care providers and midwives, can deliver basic evidence-based interventions for depression occurring in perinatal women in non-specialist settings, as described in the mental health Gap Action Programme Intervention Guide (46–48, 50).

Affirming other studies, lack of social support and experience of frequent conflicts with family members was a risk factors for PDD (26, 51–53). It is possible conflicts occur in societies such as Lao PDR where patriarchal cultural norms are predominant and mothers-in-law may have a significant influence on how the newborn and mother should be taken care of. In countries amid a demographic transition, such as Lao PPDR, there may also be conflicts related to more traditional and more contemporary infant care, such as the feeding of colostrum to the newborn (54). Patriarchal cultural norms may also contribute to IPV, and as elsewhere, IPV was associated with PDS (24, 55) and is likely to be explained by the social, emotional, and physical isolation often felt by women exposed to IPV and the unpredictability of the abuser (55–57). This underlines the need for healthcare providers to include discussion of social support and family context in

their consults with perinatal women. Low public awareness and stigma about mental disorders, and availability and acceptability of health services are also salient and symptoms of PDS may go unrecognized or be attributed to non-medical causes (49).

This study has some limitations. The study was conducted in only two districts, one urban and one peri-urban, within Vientiane Capital and cannot be considered representative of all districts in Vientiane Capital. As a cross-sectional study, we could only examine factors associated with PDS and cannot make claims about causality. Further, the EPDS provides an indicator of symptoms and is not a clinical diagnosis of depression, nor has the Lao version of the EPDS version been validated in Lao PDR, although in this study good internal consistency was demonstrated (Cronbach's alpha 0.75). We also recognize the limitation of self-report measures which may be prone to social desirability bias, especially given the stigma associated with mental illness. We also cannot exclude the possibility of recall bias. Also of note, this study was conducted before the onset of the COVID-19 pandemic, and it is possible that since then rates of PDS are higher (58, 59), underscoring the need for early detection and support for those at risk of, or experiencing, PPD.

CONCLUSION

The study identified a high proportion of mothers with postnatal depressive symptoms in a context where there is limited support for mental health disorders. This highlights the need to screen and treat mothers who present with PDS, as not doing so exposes mother and their children to a range of negative health and social outcomes. In contexts where access to mental health specialists has severely constrained maternal and child healthcare providers at primary health care must be supported to develop the necessary skills to identify risk factors and symptoms and offer basic essential services for PDS. Addressing the stigma

associated with mental health illness and domestic violence that prevents women from seeking healthcare, must also be developed, implemented, and evaluated.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Research Ethic Committee of the University of Health Sciences, Lao PDR. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

AX developed the research proposal, designed the instrument, collected data in the field sites analyzed the data, and wrote

the draft manuscript. VS, MT, BQ, and JD contributed to the statistical analysis, interpretation of results, and commented and made revisions to previous versions of the manuscript. All authors read and approved the final manuscript.

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